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Autore	Kwak Moon Kyu
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Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (XIII, 371 p. 256 illus., 154 illus. in color.)
Disciplina	620
Soggetti	Vibration Dynamical systems Dynamics System theory Physical measurements Measurement Engineering design Electronic circuits Control engineering Vibration, Dynamical Systems, Control Systems Theory, Control Measurement Science and Instrumentation Engineering Design Electronic Circuits and Devices Control and Systems Theory Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introduction -- Definition of Active Vibration Control -- Smart Materials and Structures -- Recent Technology -- Future Technology Trend -- Fundamentals of Vibrations -- Single-Degree-of-Freedom Spring-Mass-Damper System -- Free and Forced Vibration Analysis -- MATLAB and Simulink -- Control Design -- Closed-Loop System -- Stability Analysis -- Sensors and Actuators -- Accelerometer --

Piezoelectric Sensor and Actuator -- Implementation of Control Algorithms -- Analogue Circuit -- Microprocessor -- Experimental Process -- Measurement of Frequency Response -- Vibration Testing -- Application Examples -- Beam Structure -- Grid Structure.

Sommario/riassunto

This book describes the active vibration control techniques which have been developed to suppress excessive vibrations of structures. It covers the fundamental principles of active control methods and their applications and shows how active vibration control techniques have replaced traditional passive vibration control. The book includes coverage of dynamic modeling, control design, sensing methodology, actuator mechanism and electronic circuit design, and the implementation of control algorithms via digital controllers. An in-depth approach has been taken to describe the modeling of structures for control design, the development of control algorithms suitable for structural control, and the implementation of control algorithms by means of Simulink block diagrams or C language. Details of currently available actuators and sensors and electronic circuits for signal conditioning and filtering have been provided based on the most recent advances in the field. The book is used as a textbook for students and a reference for researchers who are interested in studying cutting-edge technology. It will be a valuable resource for academic and industrial researchers and professionals involved in the design and manufacture of active vibration controllers for structures in a wide variety of fields and industries including the automotive, rail, aerospace, and civil engineering sectors.
